



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/726,269

12/01/2003

Murali Basavaiah

ANDIP037/425584

3368

22434

7590

03/01/2010

Weaver Austin Villeneuve & Sampson LLP

P.O. BOX 70250

OAKLAND, CA 94612-0250

EXAMINER

UNELUS, ERNEST

ART UNIT

PAPER NUMBER

2181

NOTIFICATION DATE

DELIVERY MODE

03/01/2010

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

USPTO@wavsip.com

Office Action Summary	Application No. 10/726,269	Applicant(s) BASAVIAH ET AL.	
	Examiner ERNEST UNELUS	Art Unit 2181	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 January 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3,5-20 and 24-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3,5-20 and 24-31 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/01/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>01/29/10</u> . | 6) <input type="checkbox"/> Other: _____ |

3DETAILED ACTION

RESPONSE TO AMENDMENT

Claim rejections based on prior art

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/29/2010 has been entered.

Applicant's arguments filed 01/29/2010 with respect to claims 1-3, 5-20, and 24-31 have been fully considered but are moot in view of the new ground(s) of rejection.

INFORMATION CONCERNING OATH/DECLARATION

Oath/Declaration

1. The applicant's oath/declaration has been reviewed by the examiner and is found to conform to the requirements prescribed in **37 C.F.R. 1.63**.

INFORMATION CONCERNING DRAWINGS

Drawings

2. The applicant's drawings submitted are acceptable for examination purposes.

OBJECTIONS TO THE CLAIMS

Art Unit: 2181

2b. **Claims 7**, is objected to as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

As per **claim 7**, recites the limitation “the apparatus”. There is insufficient antecedent basis for this limitation in the claim. An apparatus was not previously mention. Correction is needed.

REJECTIONS BASED ON PRIOR ART

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. **Claims 1-3, 5-20, and 24-31**, are rejected under 35 U.S.C. 103(a) as being unpatentable over Mullendore et al. (US 2003/0185154) in view of Krakirian et al. (US 2004/0030857).

5. As per **claims 1, 24, 27, 29, 30, and 31**, Mullendore a switch **(the switch, as discloses in paragraph 0027 and fig. 4)**, comprising:

a port **(paragraph 0027 discloses “the switch device typically includes a processor, a buffer, a first port for coupling to a low speed or TCP/IP based network link”)** configured to receive a write command frame **(write 16MB, as discloses in fig. 4 and paragraph 0061)**;

a trapping mechanism (**paragraph 0046 discloses the buffer held the command within the switch**) configured to trap the write command frame (**see paragraph 0046**); and

a processor (**the processor within the switch, as discloses in paragraph 0027**) configured to process the trapped write command frame (**see paragraphs 0029 and 0061, which discloses the processor within the switch to partially transfer the write command**);

wherein the processor is further configured to initialize a transfer ready command frame (**see paragraph 0061**) and send the transfer ready command frame to the initiating Host before receiving a transfer ready command frame from the target (**see fig. 5 and paragraph 0064, which discloses “When Fast Write is disabled, RTT messages are passed transparently from target to initiator”. Clearly, fig. 5, shows XFER_RDY 128KB being sent from the switch 150 before it is received at the initiator (base on the arrow). As paragraph 0064 discloses, “RTT messages are passed transparently from target to initiator”. This XFER_RDY 128KB is shown to be coming from the target**).

but fails to disclose expressly a frame having a header comprising an originator exchange identifier (OX_ID) field or a receiver exchange identifier (RX_ID) field, as well as a Host identifier field and a target identifier field, wherein the Host and the target identifier fields identify Host and target devices, and wherein the OX_ID and the RX_ID exchange identifier fields enable the Host and the target to keep track of various transactions between each other; modifying the OX_ID field of the write command frame header to include a new value of an OX_ID exchange identifier before sending the write command frame to the target; and initialize a receiver exchange identifier (RX_ID) of a transfer ready command frame by assigning a value to the RX_ID field.

Krakirian discloses a frame (**frame 380 of fig. 12, as discloses in paragraph 0054**) having a header comprising an originator exchange identifier (OX_ID) field (**OX_ID field 368**) or a receiver exchange identifier (RX_ID) field, as well as a Host identifier field (**HSID 358**) and a target identifier field (**VDID 356**), wherein the Host and the target identifier fields identify Host and target devices (**see paragraph 0054 and fig. 12**), and wherein the OX_ID and the RX_ID exchange identifier fields enable the Host and the target to keep track of various transactions between each other (**see paragraph 0053, which discloses, “the OXID 368 and RXID 370 can then be used to track a particular exchange and validated by both the initiator and the responder”**); modifying the OX_ID field of the write command frame header to include a new value of an OX_ID exchange identifier before sending the write command frame to the target (**see paragraph 0054, which discloses, “Further it can be seen that the originator exchange ID field 368 has been changed to a value of VXID provided by the virtualization agent”**); and initialize a receiver exchange identifier (RX_ID) of a transfer ready command frame by assigning a value to the RX_ID field (**see paragraph 0054, which discloses, “Frame 380 is an example of an initial virtualization frame sent from the host to the virtualization agent, in this case the virtualization switch 252”**).

Mullendore et al. (US 2003/0185154) and Krakirian et al. (US 2004/0030857) are analogous art because they are from the same field of endeavor. The instant application, Mullendore, and Krakirian are all about a SAN fabric having a switch between a host/initiator and a target to receive a frame from the initiator to the target in a local area network (LAN) before a transfer ready command is sent from the target to the initiator.

At the time of the invention it would have been obvious to a person of ordinary skill in the art to modify a congestion management systems and methods are provided to overcome head-of-line blocking issues resulting from slower-speed network links, such as low speed WAN links or links using a TCP/IP based storage protocol as described by Mullendore and a method of placing a virtualization agent in a switch of a SAN fabric as taught by Krakirian.

The motivation for doing so would have been because Krakirian teaches, **“the virtualization switch 252 can provide the virtualization remapping functions at wire speed, performance is not a particular problem and this solution can much more readily handle much larger fabrics by the simple addition of additional virtualization switches 252 as needed”** (see paragraph 0046. See also paragraph 0117 for further detail).

Therefore, it would have been obvious to combine Krakirian et al. (US 2004/0030857) with Mullendore et al. (US 2003/0185154) for the benefit of creating the apparatus to obtain the invention as specified in claims 1, 24, 27, 29, 30, and 31.

6. As per **claim 2**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], Mullendore further discloses, “wherein the switch (150) is an initiating Switch coupled to the Host (135) in a first SAN (165) (see fig. 4).

7. As per **claim 3**, the combination of Mullendore and Krakirian discloses “the switch of claim 2” [See rejection to claim 2 above], “wherein the processor of the initiating Switch is further configured to modify the write command before forwarding the write command to the

Art Unit: 2181

target (see paragraphs 0029 and 0061 of Mullendore which discloses the processor within the switch, and paragraph 0077 discloses the switch being a router. See also paragraph 0054 of Krakirian).

8. As per **claim 5**, the combination of Mullendore and Krakirian discloses “the switch of claim 14” [See rejection to claim 14 above], “wherein the initiating switch uses the OX_ID value as a handle for accessing information pertaining to the write command session in a sessions ID table (see paragraph 0054 of Krakirian).

9. As per **claim 6**, the combination of Mullendore and Krakirian discloses “the switch of claim 2” [See rejection to claim 2 above], Mullendore discloses “wherein the processor of the initiating Switch (135) is further configured to issue a Transfer Ready command (XFER_RDY 256KB) to the Host (135) (see fig. 4).

10. As per **claim 7**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], “wherein the switch (150) is further configured to use the RX_ID value as the RX_ID for all communication related to the write frame (16MB) between the apparatus (150) and the Host (135) (see paragraph 0061 and fig. 4 of Mullendore and paragraph 0054 of Krakirian).

11. As per **claim 8 and 15**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], “wherein the switch (150) is further

configured to use the OX_ID value as the OX_ID in all communication between the apparatus and the target (see **paragraph 0061 and fig. 4 of Mullendore and paragraph 0054 of Krakirian**).

12. As per **claim 9**, the combination of Mullendore and Krakirian discloses “the switch of claim 2” [See rejection to claim 2 above], Mullendore discloses, “wherein the initiating Switch (150) is further configured to transfer additional data frames (256KB) (**paragraph 0061 discloses that the switch separate the command into smaller portions and send those portions (256KB) separately to the target**) to the target (145) when the initiating Switch (150) receives a Transfer Ready command (XFER_RDY 256KB) associated with the write frame (**write 16MB**) from the target (see fig. 4).

13. As per **claim 10**, the combination of Mullendore and Krakirian discloses “the switch of claim 30” [See rejection to claim 30 above], Mullendore discloses, “wherein the switch (140) is a target Switch coupled to the target (145) (see fig. 4).

14. As per **claim 11**, the combination of Mullendore and Krakirian discloses “the switch of claim 10” [See rejection to claim 10 above], Mullendore discloses, “wherein the target Switch (140) forwards the write command (16MB) to the target (145) (see fig. 4).

15. As per **claims 12 and 25**, the combination of Mullendore and Krakirian discloses “the switch of claim 11” [See rejection to claim 11 above], Mullendore discloses, “wherein the

Art Unit: 2181

target Switch (140) forwards data frames (128KB) associated with the write command (16MB) to the target (145) after receiving a Transfer Ready command (XFER_RDY 128KB) from the target (145) (see fig. 4).

16. As per **claim 13**, the combination of Mullendore and Krakirian discloses “the switch of claim 12” [See rejection to claim 12 above], Mullendore discloses, “wherein the target Switch (140) is further configured to buffer the data frames (128KB) prior to receipt of the Transfer Ready command (XFER_RDY 128KB) see paragraph 0061 and fig. 4.

17. As per **claim 14**, the combination of Mullendore and Krakirian discloses “the switch of claim 12” [See rejection to claim 12 above], “wherein the target Switch (140) is further configured to maintain (the buffer inside the switch having a identified data) a sessions ID table and to use the OX_ID value of the write command as an index to the session corresponding to the write command (see paragraphs 0054 and 0061 of Mullendore and paragraph 0054 of Krakirian).

18. As per **claim 16**, the combination of Mullendore and Krakirian discloses “the switch of claim 5” [See rejection to claim 5 above], wherein the target Switch (140) is further configured to modify the OX_ID value in communications between the target Switch (140) and the target (145) (see paragraphs 0029 and 0061 of Mullendore and paragraph 0054 of Krakirian).

Art Unit: 2181

19. As per **claim 17**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], wherein the Switch is further configured to use the RX_ID value of trapped write commands to specify the amount of buffer space needed for the write command and use the write command frame to request the needed buffer space (see **paragraph 0054 of Krakirian**).

20. As per **claims 18 and 26**, the combination of Mullendore and Krakirian discloses “the switch of claim 17” [See rejection to claim 17 above], wherein the Switch is further configured to use the RX_ID value of trapped write commands to specify the amount of buffer space larger than needed for the write command and use the additional buffer space for subsequent write commands so that the Switch need not wait for a Transfer Ready command to transfer data related to the subsequent write command (see **paragraph 0061 and col. 10, lines 58-65 and paragraph 0054 of Krakirian**).

21. As per **claims 19 and 28**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], Mullendore discloses, “wherein the Switch **(150)** is further configured to, in the event the Switch does not have sufficient buffer space for the write command (**write 16MB**) (see **paragraph 0064**), to either: (i) generate a busy status signal to the initiating Host; (ii) placing the write command on a pending wait list (**paragraph 0064 discloses, “then switch 150 holds the RTT message until buffer resources become sufficient to receive the entire write data specified by the RTT message ”**) ; or (iii) forwarding the write command to the target (see **paragraph 0070**).

22. As per **claim 20**, the combination of Mullendore and Krakirian discloses “the switch of claim 1” [See rejection to claim 1 above], Mullendore discloses, “a first SAN (360) including the Switch (switch A or B); a second SAN (365) including a second Switch (switch C or D); and an inter-SAN network (310) connecting the first SAN and the second SAN (see fig. 13).

RELEVANT ART CITED BY THE EXAMINER

23. The following prior art made of record and not relied upon is cited to establish the level of skill in the applicant’s art and those arts considered reasonably pertinent to applicant’s disclosure. See **MPEP 707.05(c)**.

24. The following reference teaches a SAN using Fibre Channel header to modifying a Receiver Exchange Identifier (responder identifier):

US 2009/0185678; 2006/0274755; 2005/0125418; 2004/0028043; 7,460,528

CLOSING COMMENTS

Conclusion

a. STATUS OF CLAIMS IN THE APPLICATION

25. The following is a summary of the treatment and status of all claims in the application as recommended by **M.P.E.P. 707.07(i)**:

a(1) CLAIMS REJECTED IN THE APPLICATION

26. Per the instant office action, claims 1-3, 5-20, and 24-31 have received a first action on the merits and are subject of a first action non-final.

Art Unit: 2181

DIRECTION OF FUTURE CORRESPONDENCES

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ernest Unelus whose telephone number is (571) 272-8596. The examiner can normally be reached on Monday to Friday 9:00 AM to 5:00 PM.

IMPORTANT NOTE

28. If attempts to reach the above noted Examiner by telephone are unsuccessful, the Examiner's supervisor, Mr. Alford Kindred, can be reached at the following telephone number: Area Code (571) 272-4037.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PMR system, see [her//pair-direct.uspto.gov](http://pair-direct.uspto.gov). Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217- 91 97 (toll-free).

/Alford W. Kindred/
Supervisory Patent Examiner, Art Unit 2181
February 17, 2010
/E. U./
Examiner, Art Unit 2181

Ernest Unelus
Patent Examiner
Art Unit 2181